



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/552,920

10/11/2005

Shoichiro Watanabe

043888-0399

6930

53080 7590 03/19/2009
MCDERMOTT WILL & EMERY LLP
600 13TH STREET, NW
WASHINGTON, DC 20005-3096

EXAMINER

ARCIERO, ADAM A

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

03/19/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,920	Applicant(s) WATANABE ET AL.	
	Examiner ADAM A. ARCIERO	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1795

**NONAQUEOUS ELECTROLYTE BATTERY AND CHARGE/DISCHARGE SYSTEM
THEREOF**

Examiner: Adam Arciero

S.N. 10/552,920

Art Unit: 1795

March 16, 2009

DETAILED ACTION

1. The Applicant's amendment filed on January 06, 2009 was received. Claims 1-7 remain pending.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over INOUE et al. on claims 1-2 and 6 are maintained. The rejection is repeated below for convenience.

As to Claim 1, INOUE et al. teaches a lithium-ion battery comprising a positive electrode having an active material layer, a negative electrode comprising a negative active material layer, a separator and a lithium-ion conductive non-aqueous electrolyte (col. 6, lines 30-61). Said positive active material comprises a lithium transition metal composite oxide (col. 11, lines 10-50) and said negative material comprises graphite (col. 15, lines 24-45) which is capable of intercalating and deintercalating lithium ions (col. 6, lines 30-61). The final charge voltage of said non-aqueous battery is set to 4.3 V (col. 44, Example 2). INOUE et al. does not expressly disclose the capacity ratio of the positive active material to negative active material as being 1.3 to 2.2. However, INOUE et al. teaches the ratio for the contents of the positive active material

Art Unit: 1795

and negative material, depending on the varieties of the compounds and formulations of the compositions, can be optimized so as to improve the capacity, cycle life and safety of the battery (col. 33, lines 36-59). INOUE et al. is teaching that said ratio is a results effective variable. The courts have held that optimization of a results effective variable is not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As to Claims 2 and 6, INOUE et al. teaches a positive active material comprising a lithium transition metal composite oxide represented by the formula: $\text{Li}_x\text{Co}_a\text{Ni}_{1-a}\text{O}_2$ wherein $x=0.2$ to 1.2 and $a=0.1$ to 0.9 . The prior art ranges taught by INOUE et al. overlap the claimed ranges. The courts have held that in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

4. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over INOUE et al. as applied to claim 1 above, and further in view of LU et al. (US 2003/0027048 A1) on claim 3 is maintained. The rejection is repeated below for convenience.

As to Claim 3, INOUE et al. does not expressly disclose a lithium transition metal composite oxide represented by the formula: $\text{Li}_x\text{Ni}_y\text{Mn}_z\text{M}_{1-y-z}\text{O}_2$ wherein $x= 1.0$ to 1.03 , $y= 0.3$ to 0.5 , $z=0.3$ to 0.5 and $y/z= 0.9$ to 1.1 .

However, LU et al. teaches a lithium-ion battery having a positive active material for the cathode comprising a specific composition of $\text{Li}_{1.04}\text{Ni}_{0.368}\text{Co}_{0.263}\text{Mn}_{0.38}\text{O}_2$ (pg. 5, [0054]). These value for “x” in the prior art is very close to the claimed value of “x” and the values for “y” and

Art Unit: 1795

“z” in the prior art fall within the claimed ranges for “y” and “z”. According to MPEP 2144.05, “a *prima facie* case of obviousness exists where the claimed ranges and the prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).” Therefore, at the time of the invention, it would have been obvious to a person having ordinary skill in the art to use the positive active material as disclosed by LU et al. in the lithium-ion battery of INOUE et al. to maximize said batteries performance, as taught by LU et al. (pg. 1-2, [0022]).

5. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over INOUE et al. (US 5,707,756) as applied to claim 1 above, and further in view of SHOICHIRO et al. (JP 2002-319398) on claims 4-5 are maintained. The rejection is repeated below for convenience.

As to Claim 4, INOUE et al. does not expressly disclose a lithium transition metal composite oxide comprising two composite oxides represented by the two separate formulas in claim 4.

However, SHOICHIRO et al. teaches a nonaqueous electrolyte secondary battery having a positive active material mixture comprising two positive active materials (Abstract). The first active material is $\text{Li}_x\text{Co}_y\text{M}_w\text{O}_z$ wherein $x=0.9$ to 1.1 , $y=0.85$ to 0.98 , $w=0.02$ to 0.15 and $z=1.8$ to 2.2 and M is at least one of Al, Cu, Zn, Mg, Ca, Ba and Sr (Abstract). The second positive material is represented by the formula $\text{Li}_a\text{Ni}_b\text{M}'_c\text{O}_d$ where $a=0.3$ to 1.02 , $b=0.5$ to 0.98 , $c=0.02$ to 0.5 , $d=1.8$ to 2.2 and M' is at least one of Co, Mn, Cr, Fe, V and Al (Abstract). These ranges overlap or lie inside the claimed ranges of the present application. The courts have held that in

Art Unit: 1795

the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Therefore, at the time of the invention, it would have been obvious to a person having ordinary skill in the art to use a mixture of two positive active materials to create a composite positive active material so as to heighten a discharge capacity, create a low temperature characteristic and improve a cycle characteristic, as suggested by SHOICHIRO et al. (Abstract).

As to Claim 5, INOUE et al. teaches the ratio for the contents of the positive active material and negative material, depending on the varieties of the compounds and formulations of the compositions, can be optimized so as to improve the capacity, cycle life and safety of the battery (col. 33, lines 36-59). INOUE et al. is teaching that said ratio is a results effective variable. The courts have held that optimization of a results effective variable is not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

6. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over INOUE et al. and FERNANDEZ et al. on claim 7 is maintained. The rejection is repeated below for convenience.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over INOUE et al. (US 5,707,756) as applied to claim 1 above, and further in view of FERNANDEZ et al. (US 5,637,413).

Art Unit: 1795

As to Claim 7, INOUE et al. does not expressly disclose a charge/discharge system comprising a battery as recited in claim 1 and a charger, wherein said charger is set to stop charging when the voltage of said battery reaches 4.25 to 4.5 volts.

However, FERNANDEZ et al. teaches a charger for lithium ion cells wherein an overvoltage based disconnect circuit is used so as to disconnect the battery from the charger if the voltage of the cell reaches a threshold level (col. 1, lines 56-65). At the time of the invention, it would have been obvious to a person having ordinary skill in the art to employ a charger for charging the battery of INOUE et al. with a disconnect circuit so as to stop charging the battery of INOUE et al. when said battery reaches its final charge voltage of said non-aqueous battery is set to 4.3 V (col. 44, Example 2), so as to protect the battery from overcharging, as suggested by FERNANDEZ et al.

Response to Arguments

8. Applicant's arguments filed on January 06, 2009 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

a) Applicant argues that the ratio set forth in claim 1 provides for unexpected results, as shown in Table 2 and Table 3 of the specification (claim 1).

b) INOUE et al. fails to specifically teach any ratio which discloses the unexpected results and that the "safety" of the battery is too generic and could cover a wide range of definitions.

Art Unit: 1795

In response to Applicant's arguments, please consider the following comments.

a) Examiner disagrees, Tables 2 and 3 clearly show that the Ratio ($R: W_p/W_n$) is not the only results effective variable. For each of batteries 1-29, three different "End Of Charge" voltages were used and each voltage used had an effect on the capacity maintenance rate and thermorunaway threshold temperatures. Furthermore, Applicant has failed to show that the results are significant, in Tables 2 and 3, the capacity maintenance rates and thermorunaway threshold temperatures of batteries 1-29 overlap each other when using different "End Of Charge" voltages. The courts have held that the evidence relied upon should establish "that the differences in results are in fact unexpected and unobvious and of both statistical and practical significance." *Ex parte Gelles*, 22 USPQ2d 1318, 1319 (Bd. Pat. App. & Intern. 1992).

b) INOUE et al. teaches that the ratios can be optimized in order to meet certain safety and performance requirements (col. 33, lines 55-59). Furthermore, Applicant is arguing features not claimed in the claims (safety of the battery).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

Art Unit: 1795

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795